



# Fungicides to Control Sclerotinia Head Rot in Sunflower

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**A significant reduction in head rot will significantly reduce the losses in yield and quality, and increase profits to the sunflower industry at large**

## INTRODUCTION

Head rot caused by *Sclerotinia sclerotiorum* (Lib.) de Bary is widely spread in sunflower growing areas in North America. There has been a steady increase in the incidence and severity of Sclerotinia head rot in recent years (Fig. 1). The sunflower crop in Manitoba was devastated by this disease in 2004 where the severity of head rot reached up to 80% resulting in heavy yield reductions and total losses in many fields (Fig. 2). In a normal growing season, most head infections occur during the 2-3 weeks flowering period. This study was aimed at assessing the efficacy of fungicides in reducing the head rot severity, and avoiding the heavy losses in yield and quality of seed.

Figure 1. Sclerotinia head rot and mid-stem infection



*Carpogenic germination of sclerotia produces apothecia and ascospores which infect the heads causing head rot, stems causing mid-stem rot*

Figure 2. Head rot epidemics in 2004



## MATERIALS AND METHODS

- Two years of field trials 2004-2005
- Oilseed susceptible sunflower hybrid
- 3-row plots, RCBD with 4 replicates

- 9 Fungicides at three treatments each:
  - Single application at early flowering
  - Single application at late flowering
  - Two applications, early and late
- Backpack sprayer with hand-held nozzle

## Artificial Inoculation

- Ascospores & ground sclerotinia-infected millet seed
- Applied to sunflower heads 24 h after fungicide applications
- Misting at 5 mm/30 mm for 3 wks when needed

## Disease Assessment

- Heads were assessed weekly
- Scale of 0 to 5 (severe)
- Disease index was calculated
- Measured Yield, % oil, KD, KWT
- Sclerotia in harvested seed

## RESULTS

The results are presented as means of the two years of testing. The prolonged unusual cool and wet conditions throughout the 2004 season resulted in more head rot severity than in 2005. The artificial inoculation with ascospores and ground infected millet seed under the misting system resulted in a mean head rot disease index of 6.1 for the two years. All fungicide applications reduced the head rot disease index, however a single early application of JAU6476, Lance and Topsin significantly reduced the disease index to 3.8-4.2 (Fig. 3). Two applications of Benlate, Ronilan, and Fluazinam significantly reduced the disease index to 4.3-4.4. Rovral and Quadris reduced the disease index to 4.7.

Most early fungicide applications resulted in yield improvement (Fig. 4). A single early application of Lance, JAU6476, Topsin, Benlate and Ronilan significantly improved the yield by 31-40%. Two

Figure 3. Disease index of sclerotinia head rot, 2004-05

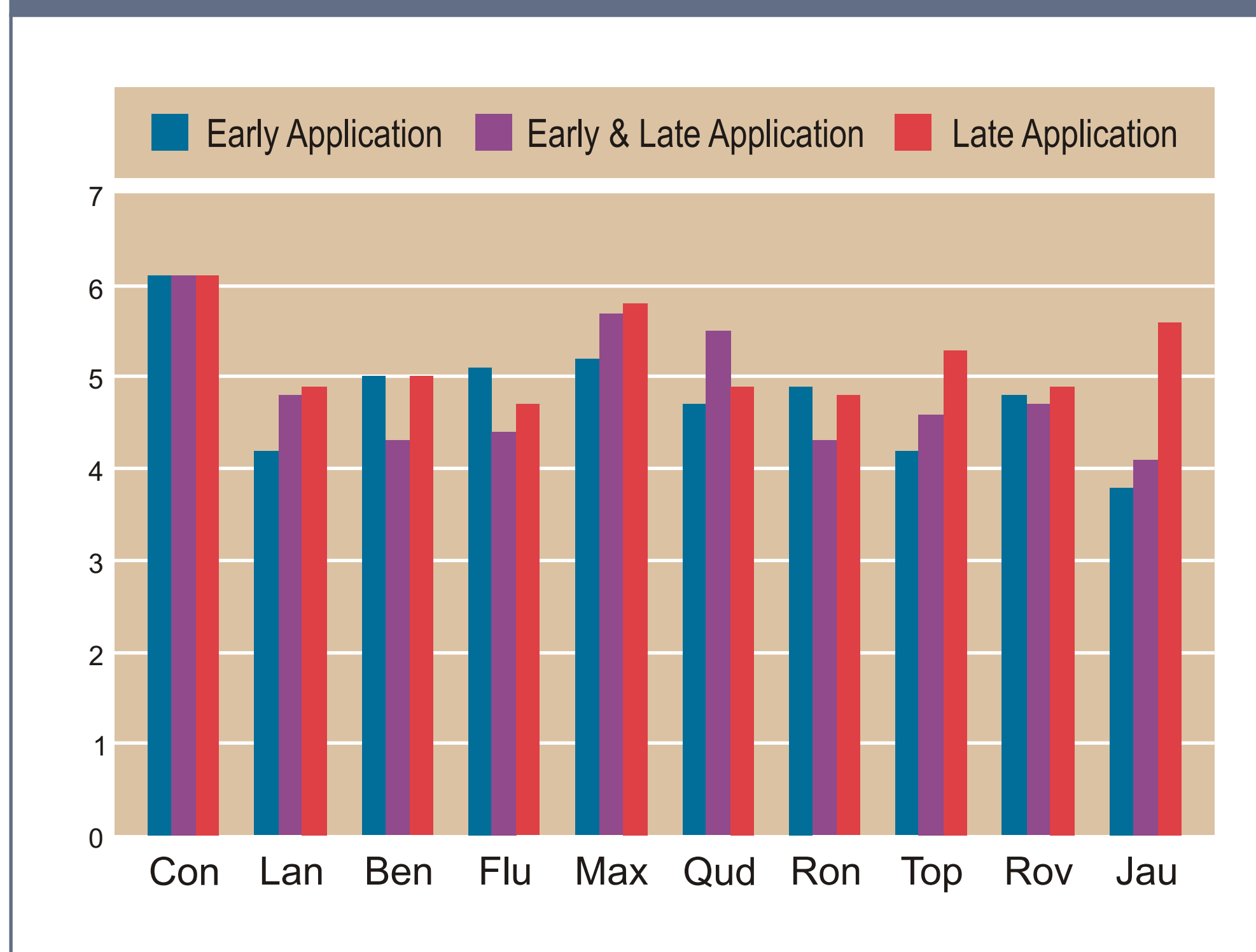


Figure 4. Yield as percent of untreated control, 2004-05

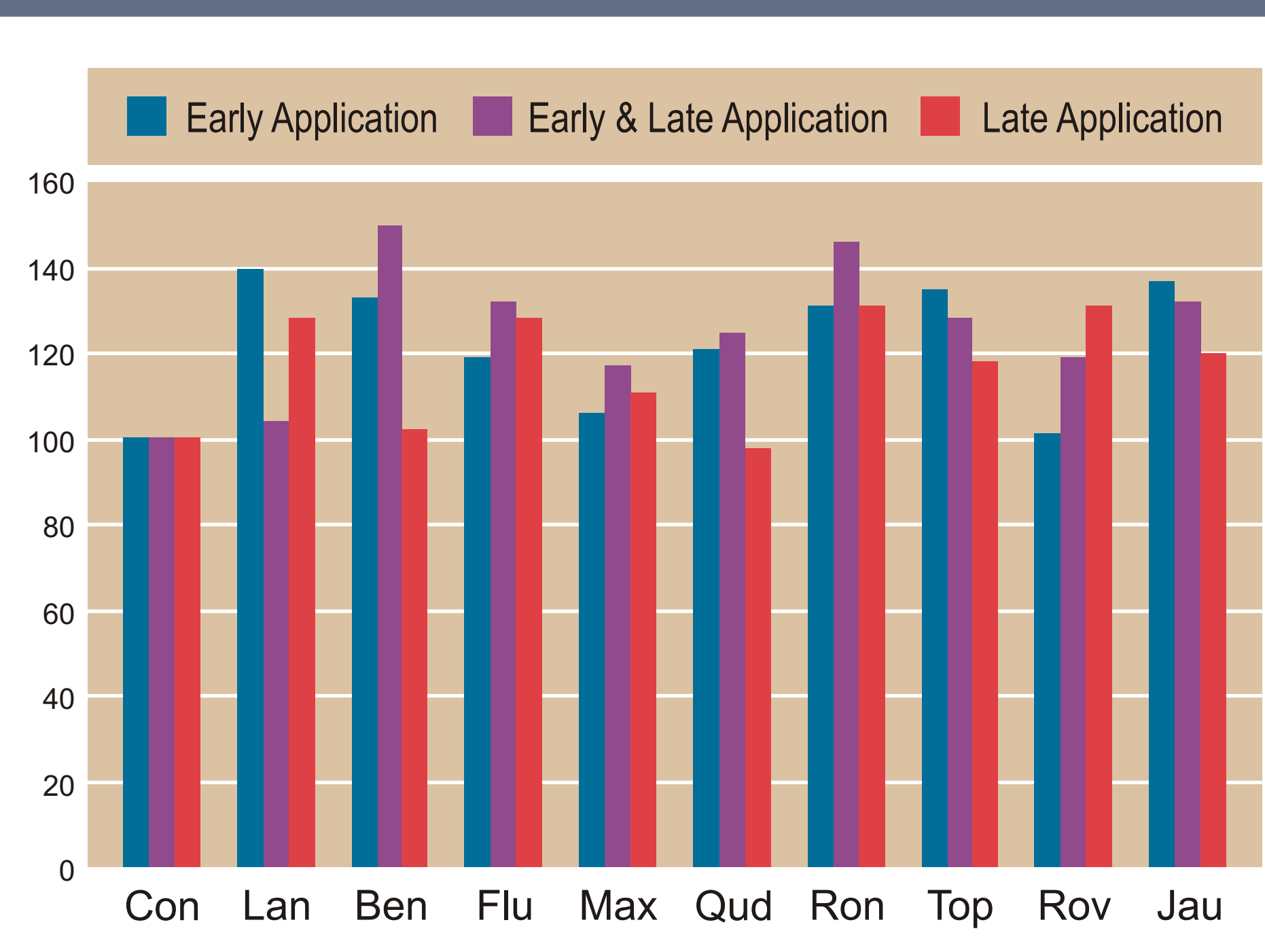
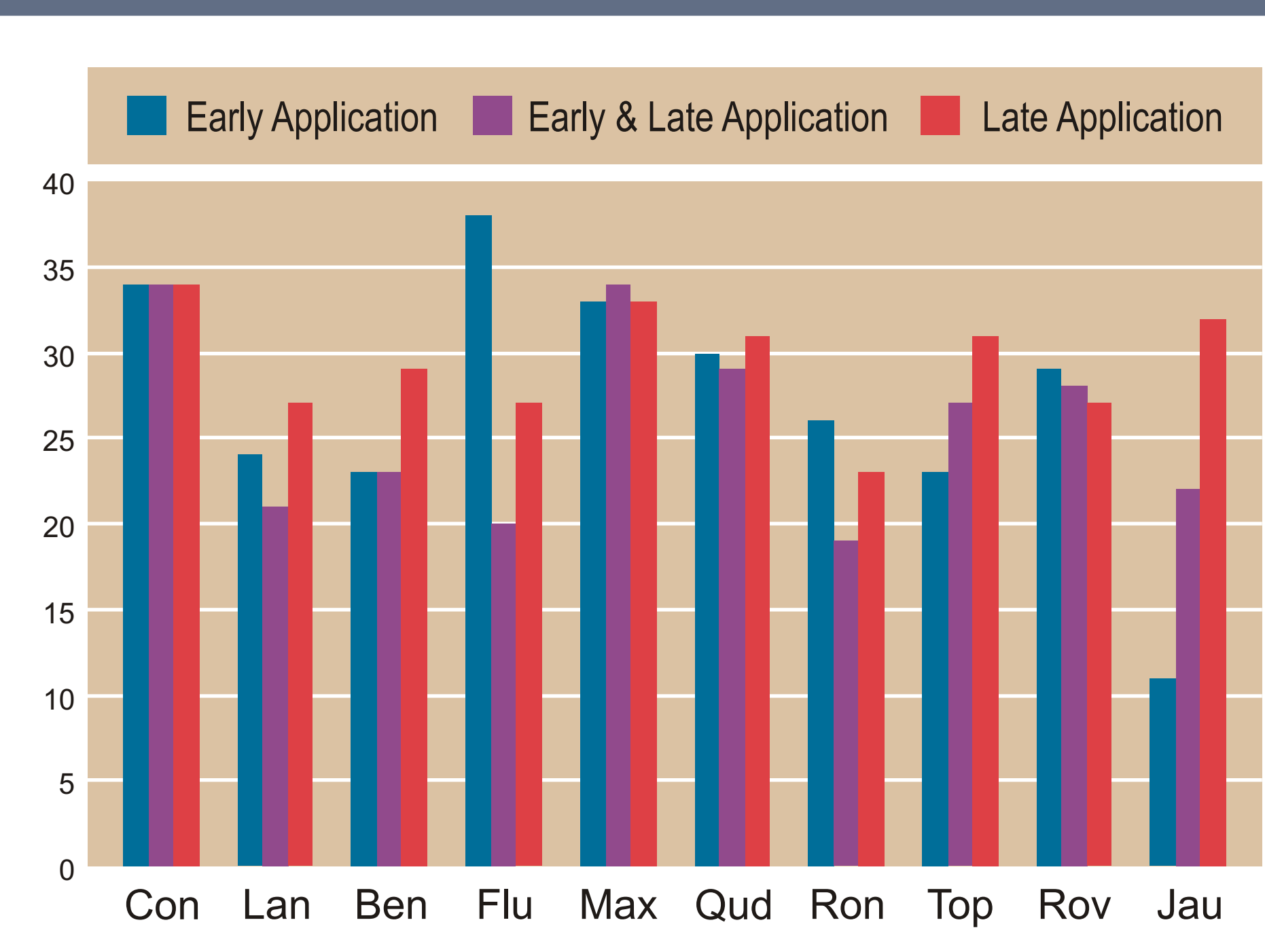


Figure 5. Percent sclerotia in harvested seed, 2004-05



applications of Benlate and Ronilan produced 46-50% yield improvement; while two applications of Rovral, Quadris and Fluazinam improved yield by 19%, 25% and 32% respectively. Most fungicide applications reduced the sclerotia in harvested seed; however, significant reductions were obtained with JAU6476, Benlate, Lance, Ronilan, and Topsin (Fig. 5).

## CONCLUSIONS

- The Fungicides JAU6476, Lance, Ronilan, Benlate and Topsin significantly reduced the head rot disease index and the number of sclerotia in seed samples; and increased yield
- Fluazinam, Quadris and Rovral reduced head rot and increased yield
- Two applications were better than one in most fungicides used
- Further studies are needed to confirm the efficacy of some fungicides, fine-tune the dates and number of applications

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